

CLAIMS

What is claimed is:

- 5 1. Apparatus for transferring parisons from an injection molding machine to a blow molding machine, said apparatus comprising:

10 an indexing table for moving a plurality of parison receiving pallets through a plurality of stations, said stations including a parison receiving station and a blow molding station; said pallets being moved sequentially from station to station in a step-by-step manner, each pallet stopping at each station for a
15 predetermined interval; each said pallet receiving a group of parisons at said receiving station;

20 means for providing at least two of said groups of parisons to said receiving station during each injection cycle of said injection-molding machine;

means for indexing said table to move said pallets from station to station;

25 means for transferring a first group of parisons to a pallet during a last portion of a said interval and for transferring a second group of parisons to a pallet during a first portion of a subsequent said interval; and

30 said blow molding station blowing a first group of parisons into blown articles during a last portion of a

said interval and blowing a second group of parisons into blown articles during a first portion of a subsequent said interval.

5 2. Apparatus as defined in claim 1 wherein said intervals are of equal length and are not more than one-half of the cycle time of said injection molding machine.

10 3. Apparatus as defined in claim 1 wherein said interval for transferring said first group of parisons is shorter than said interval for transferring said second group of parisons.

15 4. Apparatus as defined in claim 3 wherein said interval for blowing said first group of parisons is determined by the blow cycle time of the blow molding station.

20 5. Apparatus as defined in claim 1, claim 3 or claim 4 wherein two successive said intervals are substantially equal to the cycle time of said injection molding machine.

25 6. An article transfer system for an integrated injection molding and blow molding system, said transfer system including:

a rotatable table;

a plurality of article carrying means on said table;

30 a plurality of stations adjacent said table, said stations including at least an article receiving station, a first conditioning station,

a second conditioning station, a blow molding station and a part removal station;

indexing means for moving said rotatable table to enable each article carrying means to be indexed sequentially into a position cooperative with each said station;

control means for controlling said indexing means, said control means enabling said indexing means to index said table asynchronously to enable the successive transfer of at least two groups of parts from a single injection cycle onto adjacent article carrying means in a minimal interval and the successive blow molding of at least two groups of parts from a single injection cycle in a minimal interval.

7. A transfer table for an injection stretch blow mold system wherein an injection unit simultaneously injects a plurality of groups of parisons during an injection cycle and a blow molding unit blows a single group of blown articles during a blow molding cycle, said injection molding cycle being longer than said injection cycle by a factor which is greater than or equal to two,

means for indexing said transfer table through a plurality of stations, said stations including a receiving station for receiving parisons from said injection unit, a blowing station for blowing said parisons into blown articles, at least a first intermediate station between said injection station and said blowing station and at

least a second intermediate station between said blowing station and said injection station, and

means for operating said indexing means asynchronously to enable a pallet on said table to be held at a station for pre-selected intervals, said pre-selected intervals being selected so as to enable each group of parisons to remain in said at least first and second intermediate stations for an aggregate interval of time that is substantially equal for each group of parisons and to enable each group of parisons from a single injection cycle to be moved into said blowing station in rapid succession.

8. In a stretch blow molding system including an injection unit for injecting multiple groups of parisons during a single injection cycle and a blow molding unit for blow molding a single group of said parisons into blow molded articles during a single blow molding cycle, said injection molding cycle being at least twice as long as said blow molding cycle, said system including transfer means for transferring said parisons from said injection unit to said blow molding unit, an improved method for blow molding said parisons, said method comprising the sequential steps of:

transferring, at a receiving station, a first group of parisons from a first injection cycle onto said transfer means;

indexing said transfer means to move said first group of parisons away from said transfer station;

5 transferring, at said receiving station, a second group of parisons from said first injection cycle onto said transfer means;

10 indexing said transfer means to move said second group of parisons from said first injection cycle away from said receiving station;

15 indexing said transfer means to move said first group of parisons from said first injection cycle into said blow molding unit and transfer a first group of parisons from a second injection cycle onto said transfer means at said receiving station;

blow molding said first group of parisons from said first injection cycle;

20 indexing said transfer means to move said second group of parisons from said first injection cycle into said blow mold and blow molding said second group of parisons from said first injection cycle, moving said first group of parisons from said second injection cycle away from said receiving station and transferring a second group of parisons from said second injection cycle onto said transfer means at said receiving station;

25 indexing said transfer means to move said second group of parisons of said second injection cycle away from said receiving

station, to receive a first group of parisons from a third injection cycle at said receiving station; and

repeating said steps for each subsequent injection shot;

wherein said indexing steps are performed asynchronously so that the second group from each injection cycle is clamped and blown in the blow mold in a minimal period after the first group of parisons from the corresponding injection cycle is blown as determined by the physical limitations of the system.

9. In an injection stretch blowing system comprising an injection unit for injecting a plurality of groups of parisons simultaneously, transfer means for transferring parisons to an index table a group at a time, an index table for transporting said transferred group of parisons through a plurality of stations and a blow molding machine at one of said stations, said blow molding machine simultaneously blowing a single group of said parisons into blown articles, wherein said table is indexed at predetermined times and remains stationary between said predetermined times, an improved parison transfer method comprising the steps of:

transferring a first group of parisons from a first injection cycle to said table immediately prior to indexing of said table;

blowing, in said blow molding machine, a first group of parisons from another injection cycle into blown articles immediately prior to indexing of said table;

transferring a second group of parisons from said first injection cycle to said table immediately after indexing of said table; and

5 blowing, in said blow molding machine, a second group of parisons from said another injection cycle into blown articles immediately after indexing of said table.

10 10. A transfer method as defined in claim 9 wherein time intervals between said predetermined times are substantially equal.

15 11. A transfer method as defined in claim 9 wherein time intervals between said predetermined times are unequal.

12. A transfer method as defined in claim 10 wherein said interval is approximately one-half of an injection cycle time of said injection unit.

20 13. A transfer method as defined in claim 11 wherein a first time interval is substantially equal to the cycle time of said blow molding machine and a combined time of said first interval and an immediately subsequent interval is substantially equal to an injection cycle
25 time of said injection unit.